

35. (New) A nitride semiconductor device, comprising:

a) a substrate;

b) an active layer having a multiple quantum well structure containing

$\text{In}_a\text{Ga}_{1-a}\text{N}$ ($0 \leq a < 1$);

c) an n-region nitride semiconductor layer structure interposed between said substrate and said active layer, said n-region nitride semiconductor layer structure including,

an n-type contact layer,

a first n-region multi-film layer which has an undoped lower-film with an n-type impurity having a thickness within 100\AA - 500\AA , and an undoped upper film, said first n-region multi-film layer and said active layer,

d) a p-region nitride semiconductor layer structure on said active layer, said p-region nitride semiconductor layer structure including,

a p-type cladding layer,

a p-type low-doped layer on said p-type cladding layer, having a concentration of the p-type impurity which is lower than that of said p-type cladding layer; and

a p-contact layer formed on said p-type low-doped layer, having a concentration of the p-type impurity which is higher than that of said p-type multi-film layer.

36. (New) A nitride semiconductor device, comprising:

a) a substrate;

b) an active layer having a multiple quantum well structure containing

$\text{In}_a\text{Ga}_{1-a}\text{N}$ ($0 \leq a < 1$);

c) an n-region nitride semiconductor layer structure interposed between said substrate and said active layer; said n-region nitride semiconductor layer structure including,

an n-type contact layer,

a first n-region multi-film layer which has an undoped lower film having a thickness within 500\AA - 8000\AA , a middle film doped with n-type impurity, an undoped upper-film, said first n-region multi-film layer being positioned between said n-type contact layer and said active layer,

a second n-region multi-film layer positioned between said first n-region multi-film layer and said active layer, said second n-region multi-film layer being formed of lamination of two or more third nitride semiconductor films having In and two or more fourth nitride semiconductor films, alternately, said fourth nitride semiconductor layers having a composition which is different from that of said third nitride semiconductor layers, said third nitride semiconductor films and said fourth nitride semiconductor films having a thickness which is less than 100\AA respectively and being undoped layers respectively,

d) a p-region nitride semiconductor layer structure on said active layer, said p-region nitride semiconductor layer structure including,

a p-type cladding layer

a p-type low-doped layer on said p-type cladding layer, having a concentration of the p-type impurity lower than that of said p-type cladding layer;

and

a p-contact layer on said p-type cladding layer, having a concentration of the p-type impurity higher than that of said p-type low-doped layer.

37. (New) A nitride semiconductor device, comprising:

a) a substrate;

b) an active layer having a multiple quantum well structure containing $\text{In}_a\text{Ga}_{1-a}\text{N}$ ($0 \leq a < 1$);

c) an n-region nitride semiconductor layer structure interposed between said substrate and said active layer; said n-region semiconductor layer structure including,

an n-region multi-film layer contacting with said active layer, said n-region multi-film layer being formed by laminating two or more third nitride semiconductor films having In and two or more fourth nitride semiconductor films

alternately, said fourth nitride semiconductor layers having a composition which is different from that of said third nitride semiconductor layers, said third nitride semiconductor films and said fourth nitride semiconductor films having a thickness less than 100\AA respectively,

B' d) a p-region nitride semiconductor layer structure on said active layer, said p-region nitride semiconductor layer structure including,

a p-type cladding layer of multi-film layered structure,

a p-type low-doped layer on said p-type cladding layer, having a concentration of the p-type impurity which is lower than that of said p-type cladding layer; and

a p-contact layer on said p-type low-doped layer, having a concentration of the p-type impurity which is higher than that of said p-type low-doped layer.

38. (New) The nitride semiconductor device as in one of Claims 35 to 37, wherein said p-type low-doped layer is made of $\text{Al}_s\text{Ga}_{1-s}\text{N}$ ($0 < s < 0.5$), and said p-type low-doped layer has a composition ratio of Al less than that of said p-type cladding layer.

39. (New) The nitride semiconductor device as in one of Claims 35 to 37, wherein said p-type low-doped layer is formed of a multi-film layered structure with layers made of $\text{Al}_s\text{Ga}_{1-s}\text{N}$ ($0 < s < 0.5$), and an average composition ratio of Al of said p-type low-doped layer is less than that of said p-type cladding layer.

B' 40. (New) The nitride semiconductor device as in one of Claims 35 to 37, wherein the concentration of the p-type impurity of said low-doped layer is less than $1 \times 10^{19}/\text{cm}^3$.

41. (New) The nitride semiconductor device as in one of Claims 35 to 36, wherein said n-region nitride semiconductor layer structure includes an undoped GaN layer interposed between said n-type contact layer and said substrate.

42. (New) The nitride semiconductor device according to Claim 41, wherein the total thickness of said undoped GaN layer, said n-type contact layer, and said first n-region multi-film layer falls within the range of 2 through $20\mu\text{m}$.

43. (New) A nitride semiconductor device, comprising:

a) a substrate;

- b) an active layer having a multiple quantum well structure containing $\text{In}_a\text{Ga}_{1-a}\text{N}$ ($0 \leq a < 1$);
- c) an n-region nitride semiconductor layer structure interposed between said substrate and said active layer;
- d) an p-region nitride semiconductor layer structure on said active layer, p-region nitride semiconductor layer structure including,
- a p-type cladding layer of GaN,
- a p-type low-doped layer of $\text{Al}_s\text{Ga}_{1-s}\text{N}$ ($0 < s < 1$) on said p-type cladding layer, having a concentration of the p-type impurity which is lower than that of said p-type cladding layer; and
- a p-contact layer of GaN on said p-type low-doped layer, having a concentration of the p-type impurity which is higher than that of said p-type low-doped layer.

44. (New) A nitride semiconductor device, comprising:
- a) substrate;
- b) an active layer having a multiple quantum well structure containing $\text{In}_a\text{Ga}_{1-a}\text{N}$ ($0 \leq a < 1$);
- c) an n-region nitride semiconductor layer structure interposed between said substrate and said active layer;